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EXAMINER

HOLLWEG, THOMAS A

ART UNIT	PAPER NUMBER
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2879

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/534,321

Applicant(s)

YOUNG, NIGEL D

Examiner

Thomas A. Hollweg

Art Unit

2879

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14, 16 and 17 is/are rejected.
- 7) ☒ Claim(s) 15 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 May 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 9/25/2006.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on September 25, 2006, is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Objections

2. The following claims are objected to because of the following informalities:
- a. Claim 5, the "second conductive region" lacks antecedent basis.
 - b. Claim 6, reference number (12-2) is used to reference both "the first underlying conductive region" and "the first underlying electrode layer."
 - c. Claim 8 is objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from any other multiple dependent claim. See MPEP § 608.01(n). Accordingly, claim 8 will be treated as being dependent on claim 6.
- Appropriate correction is required.

Drawings

3. The drawings are objected to because figures 5D and 5E show contact region (19-1) in recess (22), but figures 6 and 7 show contact region (19-1) in recess (21).
4. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure

number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1, 6-9, 16 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Toyota Corp., (JP2002313572 A).

7. With regard to claim 1, in figure 2, Toyota discloses an electroluminescent device (1) comprising a substrate (2), a light emissive structure (3a) on the substrate (2), the light emissive structure (3a) comprising organic light emissive material (32a) disposed between first (31a) and second (33a) electrode layers for supplying charge carriers into the organic material (32a) to cause it to emit light, the first (31a) and second (33a)

electrode layers respectively underlying and overlying the organic light emissive material (32a), and an electrically conductive region (31b) underlying the light emissive structure (3a) on the substrate (2), the second overlying electrode layer (33a) and the underlying conductive region (32b) being in electrical connection through the thickness of the organic light emissive material (32a).

8. With regard to claim 6 (dependent on claim 1), in figure 2, Toyota discloses a first (3a) and a second (3b) said light emissive structure, wherein for the first light emissive structure (3a), the second overlying electrode layer (33a) is connected to the first underlying conductive region (31b), and for the second light emissive structure (3b), the first underlying electrode layer (31b) is connected to said first underlying conductive region (31b), whereby the light emissive structures (3a, 3b) are electrically connected in series [0013].

9. With regard to claim 7, in figure 2, Toyota further discloses that a common layer (31b) provides the first underlying conductive region for the first light emissive structure and the first electrode layer of the second light emissive structure.

10. With regard to claim 8, Toyota discloses that the electroluminescent device includes at least one further said light emissive structure connected in series with the first and second light emissive structures [0006, 0007].

11. With regard to claim 9, in figure 2, Toyota discloses an electroluminescent device (1) comprising a light emissive structure (3a) on a substrate (2), the light emissive structure comprising organic light emissive material (32a) disposed between first (31a) and second (33a) electrode layers for supplying charge carriers into the organic material

(32a) to cause it to emit light, the first (31a) and second (33a) electrode layers respectively underlying and overlying the organic light emissive material (32a), and an electrically conductive region (31b) underlying the light emissive structure (3a) on the substrate (2), and an electrical connection between the second overlying electrode layer (33a) and the underlying conductive region (31b) through the thickness of the organic light emissive material (32a).

12. Therefore, the structural limitations of claim 9 are the same as those disclosed by Toyota. Toyota does not expressly disclose a method of fabricating the device.

However, one of ordinary skill in the art would recognize that manufacturing the claimed device will comprise Applicant's steps of forming the electroluminescent device. Since only generic method steps and no specific method steps are claimed, the structure disclosed in Toyota anticipates Applicant's recited method step limitations of claim 9.

13. With regard to claim 16, in figure 2, Toyota discloses an electroluminescent device (1) fabricated by a method as claimed in claim 9, comprising a light emissive structure (3a) on a substrate (2), the light emissive structure comprising organic light emissive material (32a) disposed between first (31a) and second (33a) electrode layers for supplying charge carriers into the organic material (32a) to cause it to emit light, the first (31a) and second (33a) electrode layers respectively underlying and overlying the organic light emissive material (32a), and an electrically conductive region (31b) underlying the light emissive structure (3a) on the substrate (2), and an electrical connection between the second overlying electrode layer (33a) and the underlying

conductive region (31b) through the thickness of the organic light emissive material (32a).

14. With regard to claim 17 (dependent on claim 1), Toyota, in figure 1, further discloses a matrix of said light emissive structures (3) configured on said substrate (2).

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. Claims 2, 4, 5 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Toyota as applied to claim 1 above, and further in view of Nishio et al., U.S. Patent No. 6,046,547.

17. With regard to claim 2, Toyota does not expressly disclose a transistor on the substrate having its source drain path connected to the first, underlying electrode for controlling current flowing through the light emissive structure. Nishio, in figure 1B, teaches an electroluminescent device including a transistor (3) on the substrate (1) having its source drain path (3a) connected to the first, underlying electrode (2) for controlling current flowing through the light emissive structure.

18. At the time of invention, it would have been obvious for a person having ordinary skill in the art to construct the Toyota device including a transistor connected to the first underlying electrode, as taught by Nishio, so that the current flowing through the device and the light emitted from the device can be easily controlled. Toyota and Nishio are

analogous because they are from the same field of endeavor of electroluminescent devices.

19. With regard to claim 4 (dependent on claim 1), Toyota discloses that the underlying conductive region (31b) is electrically connected to the second electrode (33a) through the thickness of the organic light emissive material (32a), but it does not expressly disclose that the electrical connection is made with electrically conductive protuberances formed on the underlying conductive region. Nishio, in figure (1B), teaches an electroluminescent device wherein the underlying conductive region (2) is formed with electrically conductive protuberances (9) which extend through the thickness of the organic light emissive material (5), and the second electrode (6) is electrically connected to said protuberances (9).

20. At the time of invention, it would have been obvious for a person having ordinary skill in the art to construct the Toyota device where the underlying conductive region was electrically connected to the second electrode by electrically conductive protuberances through the thickness of the organic light emissive material, as taught by Nishio. Electrically conductive protuberances can effectively and reliably electrically connect two electrodes that are on opposing sides of an organic emissive layer.

21. With regard to claim 5, (dependent on claim 1), Toyota discloses that the underlying conductive region (31b) is electrically connected to the second electrode (33a) through the thickness of the organic light emissive material (32a), but it does not expressly disclose that the organic light emissive material has been damaged in an area

thereof overlying the second conductive region, and the second electrode is electrically connected to the underlying conductive region through the damaged area.

22. Nishio, in figure 8B, teaches that the organic light emissive material (405) is formed before the connecting portion (410) is formed (col. 14, lines 57-64). Therefore, Nishio teaches that the organic light emissive material (405) has been damaged (by removal) in an area (410) thereof overlying the underlying conductive region (404), and the second electrode (411) is electrically connected to the underlying conductive region (404) through the damaged area (410).

23. At the time of invention, it would have been obvious for a person having ordinary skill in the art to construct the Toyota device by first forming the organic light emissive material and then damaging it (by removal) in an area overlying the underlying conductive region, as taught by Nishio, so the second electrode can be electrically connected to the underlying conductive region through the damaged area. Connecting the underlying conductive region and the second electrode by removing part of the organic light emissive material would be efficient and would create a reliable connection between these two components.

24. With regard to claim 14, all of the features of the device of claim 14 are disclosed in the modified device discussed in the rejection of claim 4. However, Toyota and Nishio do not expressly disclose a method of fabricating the modified device. However, one having ordinary skill in the art would recognize that manufacturing the claimed device will comprise Applicant's steps of forming the modified electroluminescent device. Since

only generic method steps and no specific method steps are claimed, the structure disclosed in Toyota meets Applicant's recited method step limitations of claim 14.

25. Therefore, at the time of invention it would have been obvious to one having ordinary skill in the art to construct the modified electroluminescent device disclosed by Toyota and Nishio with the method of claim 14, since the method steps are obvious in the light of the resultant structure.

26. Claims 3, 10, 11, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Toyota as applied to claim 1 above, in view of Kobayashi, U.S. Patent Application Publication No. 2002/0057051.

27. With regard to claim 3 (dependent on claim 1), all of the limitations of claim 3 are disclosed by Toyota, including, in figure 2, the second electrode (33a) extends transversely through the thickness of the organic light emissive material (32a) and is electrically connected to the underlying conductive region (31b). Toyota does not expressly disclose that the underlying conductive region has been treated in an area thereof in such a way as to repel the organic light emissive material.

28. Kobayashi, in figures 1a-g, teaches treating (4) an area (3) in such a way as to repel the organic light emissive material (50) [0049-0051]. At the time of invention, it would have been obvious for a person having ordinary skill in the art to construct the Toyota device where the underlying conductive region has been treated in an area thereof in such a way as to repel the organic light emissive material, as taught by Kobayashi, and the second electrode extends transversely through the thickness of the organic light emissive material and is electrically connected to the underlying conductive

region in said treated area. Using a repellant treatment is well known in the art and would be an effective way to enable a good connection between the underlying conductive region and the second electrode. Toyota and Kobayashi are analogous because they are from the same field of endeavor of electroluminescent devices.

29. With regard to claim 10, all of the features of the device of claim 10 are disclosed in the modified device discussed in the rejection of claim 3. However, Toyota does not expressly disclose a method of fabricating the modified device. However, one having ordinary skill in the art would recognize that manufacturing the claimed device will comprise Applicant's steps of forming the modified electroluminescent device. Since only generic method steps and no specific method steps are claimed, the structure disclosed in Toyota meets Applicant's recited method step limitations of claim 10.

30. Therefore, at the time of invention it would have been obvious to one having ordinary skill in the art to construct the modified electroluminescent device disclosed by Toyota with the method of claim 10, since the method steps are obvious in the light of the resultant structure.

31. With regard to claim 11, all of the limitations of claim 11 are discussed in the rejection of claim 10, except coating the underlying conductive region with a material that is repellent to the light emissive material. Kobayashi, in figures 1a-g, teaches coating the underlying conductive region (3) with a material (4) that is repellent to the light emissive material (50) [0049-0051].

32. At the time of invention, it would have been obvious for a person having ordinary skill in the art to construct the modified electroluminescent device including coating the

underlying conductive region with a material that is repellent to the light emissive material, as taught by Kobayashi, to assure that the light emissive material is deposited in the desired areas and is not deposited in other areas.

33. With regard to claim 12, all of the limitations of claim 12 are discussed in the rejection of claim 11, except selectively removing portions of the repellent coating on the first underlying electrode. Kobayashi, teaches a method for constructing organic electroluminescent devices where layers may be applied and then selectively removed, by etching or some other method, to achieve a desired result [0047]. One of ordinary skill would understand that the repellent coating could be applied and then selectively removed from areas where it is desired that the light emissive material remain.

34. At the time of invention, it would have been obvious for a person having ordinary skill in the art to construct the modified electroluminescent device including selectively removing portions of the repellent coating on the first underlying electrode, as taught by Kobayashi, to assure that the light emissive material is deposited in the desired areas and is not deposited in other areas.

35. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Toyota as applied to claim 9 above, in view of Friend et al., U.S. Patent No. 6,861,799 B1.

36. Toyota discloses all of the limitations of claim 13, except it does not expressly disclose treating regions of the device such as to enhance wetting of the light emissive layer on the first electrode layer. Friend teaches treating regions of an organic electroluminescent device such as to enhance wetting of an organic layer on a conductive layer.

37. At the time of invention, it would have been obvious for a person having ordinary skill in the art to construct the Toyota device including treating regions of the device such as to enhance wetting of the light emissive layer on the first electrode layer, as taught by Friend, to ensure the light emissive layer is applied to the appropriate areas of the device. Toyota and Friend are analogous because they are from the same field of endeavor of organic electroluminescent devices.

Allowable Subject Matter

38. Claim 15 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

39. The prior art of record does not show or fairly suggest a method of fabricating an electroluminescent device comprising fabricating a light emissive structure on a substrate, the light emissive structure comprising organic light emissive material, first and second electrode layers, and an electrically conductive region (12-2) underlying the light emissive structure on the substrate, and forming an electrical connection between the second overlying electrode layer and the underlying conductive region through the thickness of the organic light emissive material, where the electrical connection is formed by treating the organic light emissive material an area thereof overlying the second conductive region to become electrically conductive, and electrically connecting the second electrode to the underlying conductive region through the treated area.


Conclusion

40. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas A. Hollweg whose telephone number is (571) 270-1739. The examiner can normally be reached on Monday through Friday 7:30am-5:00pm E.S.T..

41. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

42. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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